GNU autotools and building an app

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Outline

- Why?

- GNU Autotools

- Autogen.sh

- aclocal

- autoconf

- automake

- GNU Build Process

- Autogen.sh

- Configure.ac

- Makefile.am

- Make targets

- LibTool

- References

- Platform Issue

- Makes the process easier

  – Configure, make, make install

GNU Autotools

- Autogen.sh
- Aclocal
- Autoconf
- Automake
- Libtool

Autogen.sh

- (a.k.a. buildconf)

- provides automatic build system preparation

- POSIX shell script

- preparing a build system for compilation

- verifying versions,

- ensuring necessary functionality

- common build preparation issues.

aclocal

- combining stock installed macros + user defined macros + `acinclude.m4' → aclocal.m4

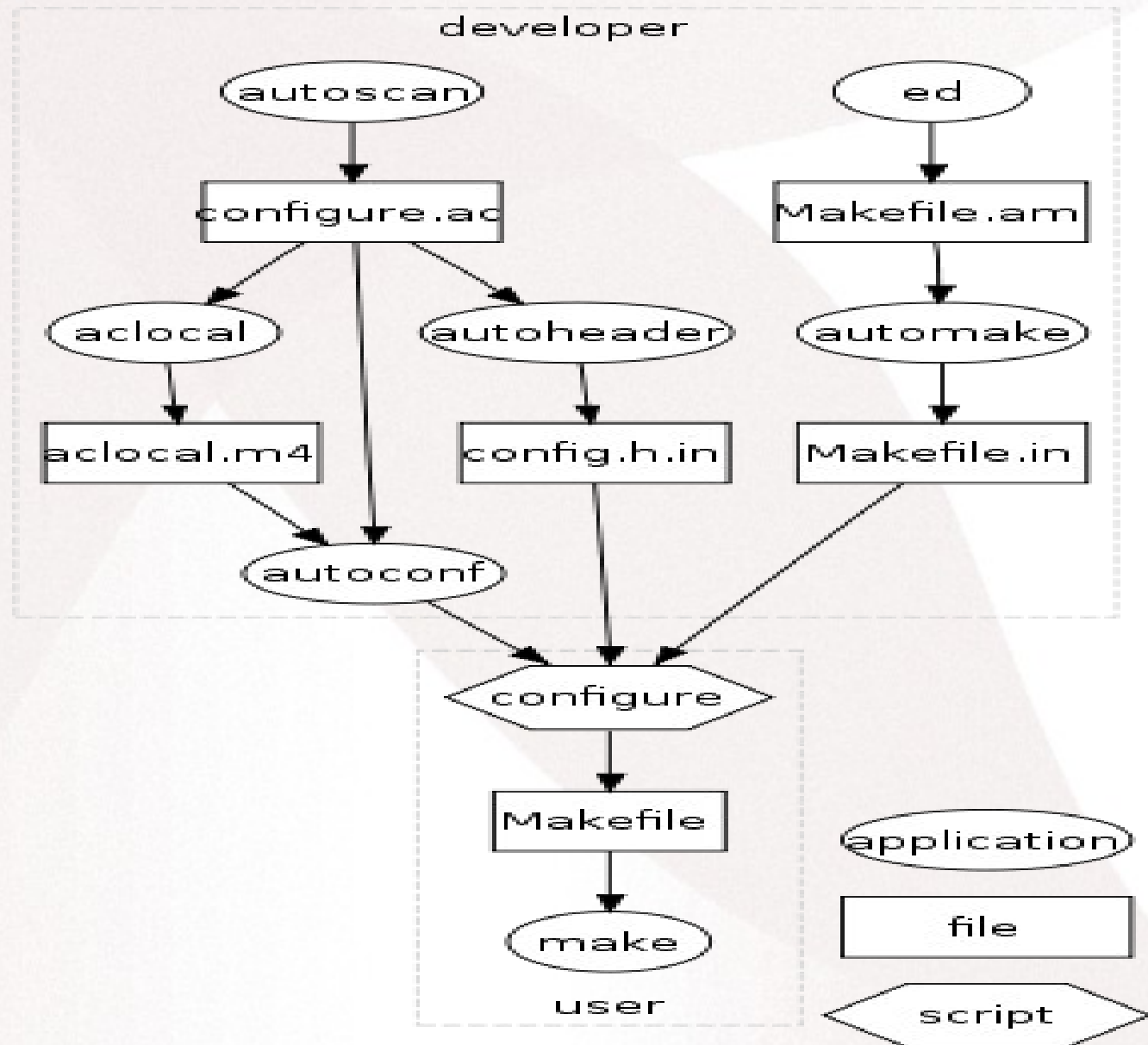- to define all of the macros required by `configure.in' in a single file

autoconf

- expands the m4 macros in `configure.in', perhaps using macro definitions from `aclocal.m4' -> generate the configure script.

automake

- tool for automatically generating `Makefile.in' files compliant with the GNU Coding Standards

GNU Build Process

Autogen.sh

```
srcdir=`dirname $0`
test -z "$srcdir" && srcdir=.

PKG_NAME=<Package_Name>
REQUIRED_AUTOCONF_VERSION=2.58
REQUIRED_AUTOMAKE_VERSION=1.10
REQUIRED_LIBTOOL_VERSION=2.2
REQUIRED_INTLTOOL_VERSION=0.35.5

(test -f $srcdir/configure.ac \
  && test -f $srcdir/ChangeLog \
  && test -d $srcdir/<filename>) || {
    echo -n "**Error**: Directory "\`$srcdir\'" does not look like the"
    echo " top-level $PKG_NAME directory"
    exit 1
}

which gnome-autogen.sh || {
    echo "You need to install gnome-common from the GNOME CVS"
    exit 1
}

USE_GNOME2_MACROS=1 . gnome-autogen.sh
```

Configure.ac

- The AC_PREREQ(version) macro can be used to ensure that a recent enough version of the autoconf program is available to process the configure.ac file

- AC_INIT(package, version, bug-report-address)

  - specifies the name and version of the software package

- *AC_SUBST*   *exports variable into generated files*

- *PKG_CHECK_MODULES(prefix, list-of-modules, action-if-found, action-if-not-found)*   checks for programs

- AC_CHECK_LIB   checks for libraries

- AC_CHECK_HEADERS   checks for header files

- AC_PROG_CC   checks for compiler characteristics

- AC_CHECK_FUNCS   checks for library functions

- AC_CONFIG_FILES([file...])

- AC_OUTPUT

- dnl Comment … …

Makefile.am

- bin_PROGRAMS = foo
- foo_SOURCES=foo.c foo.h
- foo_CPPFLAGS = lib_CFLAGS
- foo_LIBADD = lib_LIBS
- noinst_PROGRAMS=test
- EXTRA_DIST=disclaimer.txt

Make targets

- dist   Builds a tarball (.tar.gz) for distribution

- distcheck   Builds a tarball, then tries to compile it

- clean   Deletes the results of compilation (object files and executables), but may not delete some generated files that come with the distribution.

- install   Creates installation directories if needed, and copies the software into them.

- uninstall   Reverses the install (deletes installed files).

- distclean   Reverse the effects of the configure script and the all target; that is, revert a tarball to its pristine state.

- mostlyclean   Nearly the same as clean, but leaves some object files that most likely don't need to be rebuilt.

- maintainer-clean   More thorough than clean; may delete some files that require special tools to rebuild, such as machine-generated source code.

- check   Runs a test suite if you have one

LibTool

- used for creating portable compiled libraries

- GNU Libtool simplifies the developer's job by encapsulating both the platform-specific dependencies, and the user interface, in a single script. GNU Libtool is designed so that the complete functionality of each host type is available via a generic interface, but nasty quirks are hidden from the programmer.

- GNU Libtool's interface aims to be consistent. Users are not expected to read low-level documentation in order to have a source package build shared libraries. They should only have to run the package's configure script (or equivalent), and Libtool should take care of the details.

References

- http://developer.gnome.org/doc/GGAD/z70.html

- http://sourceware.org/autobook/autobook/autobook_75.html

- http://en.wikipedia.org/wiki/GNU_build_system

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Questions ???